REMARKS

The Examiner alleges the application contains claims directed to patentably distinct species as follows:

Figure **4**
Figure **5**
Figure **6**
Figure **7**
Figure **13**
Figure **14**

The Examiner also states that the applicant is required under 35 USC 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable.

To comply with the applicable requirements applicant hereby elects the species that the Examiner believes is best illustrated by Figure **4**. The following claims read on this alleged species:

106-160

The above election is made to avoid this response being considered non-responsive.

<u>Traversal of Election/Restriction Requirement</u>

Applicant respectfully requests that the Examiner carefully reconsider the Figures and election requirement because in applicant's view, the above mentioned Figures do not provide a one to one correspondence with separate species.

Explanation of the relationships between the Figures

Effectively, the first few Figures provide depictions of a broad view of the embodiments described and the successively later figures provide detailed views of various specific aspects of these embodiments. For example, Figure **3** is a detailed view of block **23** in Figure **2**, and Figure **14** is a detailed view of block **27** in Figure **2**. In addition, Figure **4** is a detailed view of block **108** in Figure **3** and Figure **13** is a detailed view of Block **109** in Figure **3**. Further, Figure **5** is a detailed view of block **112** in Figure **4**, Figure **6** is a detailed view of block **114** in Figure **4** and Figure **7** is a detailed view of block **184** in Figure **4**. Figures **8-12** show representations and conceptualizations of data and processes depicted in Figures **1-7**, **13** and **14**.

More particularly, Figure **2** is a flowchart representing blocks of code for directing a processor to carry out a process for processing seismic data associated with a plurality of planar regions in a 3D region.

Figure **3** depicts blocks of code for directing a processor to carry out a sub-process of the process shown in Figure **2**, namely, a process for producing a optimized velocity field for a single control plane in the 3D region. Figure **4**, depicts blocks of code associated with a sub-process of Figure **3** that direct a processor to produce an initial velocity field for the control plane. Figure **13** depicts block of code associated with a sub-process of Figure **3** that directs the processor to produce an optimized velocity field for the control plane from the initial velocity field produced by the process shown in Figure **4**.

Figure **5** depicts a sub-process of Figure **4** by which a starting velocity field estimate is produced from a 2D array of Seismic data derived from the data associated with the control plane under consideration. Figure **6** depicts a sub-process of Figure **4** by which the starting velocity field estimate produced by the process shown in Figure **5** is used to produce a migrated starting velocity field employed in the process shown in Figure **4**. Figure **7** shows a block of codes that is called as a sub-process of Figure **6** for producing a migrated velocity

field estimate using NMO'd PSI Simulated CMP gathers and the starting velocity field estimate produced by the process shown in Figure **5**

The block of codes shown in Figure **7** is also called as a sub-process of Figure **4** to adjust the migrated starting velocity field produced by the process of Figure **6** in response to NMO PSI gathers produced from the migrated starting velocity field produced by the process of Figure **6** and the migrated velocity field itself.

Figure **14** depicts a block of codes for directing a processor to employ the velocity field produced according to the process of Figure **3** to produce an optimized velocity field for a planar region nearby the control plane and as part of this process the process shown in Figure **13** is employed to produce an optimized velocity field in response to an initial velocity field defined earlier in the process depicted in Figure **14** and an array of 2D seismic data associated with a planar region nearby the control plane.

Effectively, the processes shown in Figures **7** and **13** are invoked by different parts of the overall process depicted in Figures **2-6** and **14** and act as sub-processes to the overall process. The claims are directed to this overall process and different sub-processes thereof.

__Relationship between Claims and Figures__

Claims **1-105** generally relate to methods, apparatus and media for estimating a seismic velocity field from seismic data comprising time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween. This is depicted in Figures **1-14**.

Claims **106-160** generally relate to methods and apparatus for producing an initial velocity field estimate for a control plane from seismic data associated with said control plane and comprising time-amplitude representations

associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween. This is depicted in Figures **4**, **5**, **6**, and **7**.

Claims **161-167** generally relate to methods and apparatus for producing a starting velocity field estimate from seismic data comprising time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween. This is depicted in Figure **5**.

Claims **170-186** generally relate to methods and apparatus for producing a migrated velocity field in response to seismic data comprising time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween. This is depicted in Figures **6** and **7**.

Claims **187-209** generally relate to methods and apparatus for producing an output velocity field in response to an input velocity field and seismic data comprising time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween, the seismic data being arranged into common midpoint (CMP) gathers associated with respective CMP locations. This is depicted in Figure **7**.

Claims **210-250** generally relate to methods and apparatus for producing an optimized velocity field in response to an initial velocity field and seismic data comprising time-amplitude representations associated with source-receiver locations spaced apart by an offset distance and having a midpoint therebetween, the seismic data being arranged into common midpoint (CMP) gathers associated with respective CMP locations. This is depicted by Figures **13** and **7**.

In the event the Examiner appreciates applicant's the above relationships between the Figures and the Claims, applicant respectfully requests that the

Examiner direct his attention to Claims **1-105** first. If the Examiner finds the independent claims of this group to be unpatentable, then to direct his attention to claims **2-15** and **56-69**. The subject matter corresponding to these claims is depicted in Figures **4**, **5**, **6**, and **7**.

Applicant herewith petitions for an automatic extension of time for one month, from November 3, 2005 to December 3, 2005, for responding to the outstanding Office Action dated October 3, 2005.

A check in the amount of **$120.00** is attached for the large entity extension fee pursuant to 37 C.F.R. Section 1.17(a).

Respectfully submitted,

12/2/05

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